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EXAMINER

BARTON, JEFFREY THOMAS

ART UNIT	PAPER NUMBER
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1753

DATE MAILED: 11/03/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

SC

Office Action Summary	Application No. 09/928,590	Applicant(s) SPENCE ET AL.	
	Examiner Jeffrey T. Barton	Art Unit 1753	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 September 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2-37 and 39-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2-37 and 39-54 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 13 August 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input checked="" type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. <u>20041028</u> |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Priority

1. Applicant's claim for domestic priority under 35 U.S.C. 119(e) is acknowledged. Likewise, the status of this application as a continuation in part of application 08/932,774 (Now U.S. Patent 6,221,654) is acknowledged. However, U.S. Patent 6,221,654 fails to provide adequate support under 35 U.S.C. 112 for claims 4, 6, 9, 12, 14-17, 20, 24, 27, 30, 37, 43-48, and 50 of this application. These limitations are not addressed in the specification filed on 25 September 1997, and benefit of this date is not granted.

Claim Objections

2. Claim 19 is objected to because it is a duplicate of claim 18. Appropriate correction is required.
3. As currently written, claim 43 is objected to because of insufficient enablement in the specification for a method of using all listed flow control means in a single method. Applicant's attention is drawn to the accompanying Interview Summary. (PTO-413; Paper No./Mail Date 20041028) As per the interview of 28 October 2004, the claim is treated herein as though "and" was replaced with "or" in line 3 of the claim. Appropriate correction is required.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 51, 52, 54, 2, 5, 8, 10, 13-19, 21, 25-29, 31-36, and 39-49 are rejected under 35 U.S.C. 102(b) as being anticipated by Kamentsky.

Regarding claim 51, Kamentsky discloses a device (Figure 1) comprising a substrate having an analysis unit microfabricated thereon (Column 1, lines 64-69), comprising: a main channel (3) with an inlet, detection region downstream of the inlet (adjacent to detection means 4), and a branch point discrimination region (9) adjacent to and downstream of the detection region; two branch channels originating at the branch point in communication with the main channel (10, 11); and a flow control system adapted to direct each particle into a selected branch channel (Components 4-8 and 14-17)

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Regarding claim 52, Kamentsky discloses a device where the flow control is responsive to a detector responsive to a characteristic of the analyte. (Column 1, line 71 - Column 2, line 19)

Regarding claim 54, Kamentsky discloses a method of using his device, the method comprising: flowing a sample of cells through the main channel so that one cell at a time passes the detection region (Column 1, lines 60-75); interrogating each cell for a characteristic as it passes (Column 1, lines 71-75); and directing the flow of each cell into a branch channel according to the results of the interrogation. (Column 2, lines 2-19)

Regarding claim 2, Kamentsky discloses a reservoir. (Figure 1, container 2)

Regarding claim 5, Kamentsky discloses analysis of cells (Abstract)

Regarding claim 8, Kamentsky discloses electrophoretic flow control (Figure 2; Column 2, lines 20-38)

Regarding claims 10, 16, 36, 43, and 47 Kamentsky discloses flow caused and controlled by pressure gradients between channels and the junction. (Figure 1, pumps 18, 19, 21; Column 4, lines 10-26)

Regarding claim 13, Kamentsky discloses flow stoppage-based control. (Column 2, lines 12-19)

Regarding claims 14, 15, 44 and 45, Kamentsky discloses flow control by a voltage gradient between the branch channels (which comprise electrodes that cause the gradient) and the junction (Figure 2; Column 5, lines 15-48)

Regarding claims 17 and 48, capillary action will inevitably exist upon introduction of a fluid from a wide to narrow conduit, e.g. at junction of 2 and 3 in figure 1.

Regarding claims 18, 19, and 49, Kamentsky discloses flow control using valves. (Figure 1, valves 14 and 15)

Regarding claim 21, Kamentsky discloses optical detection of the separation characteristic. (Column 3, lines 2-49)

Regarding claims 25, 35, 40, and 42, Kamentsky discloses the characteristic being determined by a spectroscopically detectable reporter (Nucleic acid as a chromophore within the cell). (Column 3, lines 2-49; definition of 'reporter' in specification at page 13, lines 6-25 does not exclude material naturally within the cell)

Regarding claim 26, Kamentsky discloses separation by size. (Column 1, lines 71-75)

Regarding claim 27, Kamentsky discloses a light scattering apparatus in the detection apparatus. (Column 3, lines 11-18)

Regarding claims 28, 29, 31, and 41, Kamentsky discloses the detection apparatus including source and detection apparatus (photodiodes) for electromagnetic radiation. (Column 3, lines 20-24)

Regarding claim 32, Kamentsky discloses the detector being positioned to target molecules in a predetermined region. (Figure 1)

Regarding claims 33, 34, and 39, Kamentsky discloses the channels being about 100 microns in diameter (Column 4, lines 66-70), which is about two times as large as

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the mammalian cells he analyzes, according the instant specification. (Page 21,lines 24-27)

Regarding claim 46, Kamentsky discloses the main channel (3) comprising an electrode. (Figure 2)

6. Claims 51, 52, 7, 8, 14, 15, 20, and 28-30 are rejected under 35 U.S.C. 102(e) as being anticipated by Ramsey et al.

Regarding claim 51, Ramsey et al disclose a device (Figures 16 and 17) comprising a substrate having an analysis unit microfabricated thereon (Column 3, lines 23-27), comprising: a main channel with an inlet, detection region downstream of the inlet (Column 7, lines 43-46), and a branch point discrimination region adjacent to and downstream of the detection region (Figures 16 and 17); two branch channels originating at the branch point in communication with the main channel (Figures 16 and 17); and a flow control system adapted to direct each particle into a selected branch channel (Column 7, lines 25-60)

Regarding claim 52, Ramsey et al disclose a device where the flow control is responsive to a detector responsive to a characteristic of the analyte. (Column 7, lines 43-46, 56-60)

Regarding claims 7 and 8, Ramsey et al disclose electrophoretic and electroosmotic flow control. (Column 6, lines 36-50)

Regarding claims 14 and 15, Ramsey et al disclose flow control by a voltage gradient between the branch channels and junction, caused by electrodes in the branch channels. (Column 3, lines 62-64; Column 8, lines 50-53)

Regarding claim 20, Ramsey et al disclose reversible flow. (Column 5, lines 2-5)

Regarding claims 28-30, Ramsey et al disclose a detection apparatus comprising source and detector (CCD) for electromagnetic radiation. (Column 3, line 65 - Column 4, line 4)

7. Claims 51 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Gourley et al.

Regarding claim 51, Gourley et al disclose a device (Figure 4a) comprising a substrate having an analysis unit microfabricated thereon (Column 11, line 57 - Column 12, line 12), comprising: a main channel with an inlet (62), detection region downstream of the inlet (20), and a branch point discrimination region adjacent to and downstream of the detection region (Processing reservoirs 68); two branch channels originating at the branch point in communication with the main channel (leading to reservoirs 68); and a flow control system adapted to direct each particle into a selected branch channel (Column 15, lines 37-46)

Regarding claim 12, Gourley et al disclose flow control by optical trapping. (Column 7, line 50 - Column 8, line 7)

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8. Claims 9, 20, 37, and 50 are rejected under 35 U.S.C. 102(a) as being anticipated by Blankenstein. (Note - Blankenstein also discloses devices and methods according to claims 51, 35, 36, and 54, as described below, but is not prior art for these claims, which are supported in the specification of U.S. Patent 6,221,654)

Corresponding to claim 51, Blankenstein discloses a device (Figure 8) comprising a substrate having an analysis unit microfabricated thereon (Page 19, lines 24-31), comprising: a main channel (5) with an inlet, detection region downstream of the inlet (adjacent to microscope objective 16), and a branch point discrimination region (where channels 6 and 7 split) adjacent to and downstream of the detection region; two branch channels originating at the branch point in communication with the main channel (6 and 7); and a flow control system adapted to direct each particle into a selected branch channel (Page 24, lines 29-36)

Corresponding to claim 54, Blankenstein discloses a method of using his device, the method comprising: flowing a sample of cells through the main channel so that one cell at a time passes the detection region (Page 24, lines 24-26; Page 3, lines 30-31); interrogating each cell for a characteristic as it passes (Page 24, lines 29-30); and directing the flow of each cell into a branch channel according to the results of the interrogation. (Page 24, lines 31-36)

Corresponding to claims 35 and 36, Blankenstein discloses separation due to fluorescent agents associated with the cells (Page 24, lines 8-9; Figure 7)

Regarding claim 9, Blankenstein discloses dielectrophoretic flow control. (Page 9, lines 15-20)

Regarding claims 20, 37, and 50, Blankenstein discloses reversible flow. (Page 24, line 36 - Page 25, line 4)

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

11. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

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consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

12. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over either Kamentsky or Ramsey et al in view of Parce et al. (U.S. 5,779,868)

Kamentsky and Ramsey et al disclose devices as described above in addressing claim 51. Kamentsky also suggests flexibility in choice of substrate materials. (Column 1, lines 64-69)

Neither Kamentsky nor Ramsey et al explicitly disclose constructing the channels in a silicon substrate.

Parce et al disclose fabrication of capillary channels for analytical devices in a silicon substrate using well-known lithographic techniques. (Column 4, lines 6-56)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kamentsky by replacing his glass substrate for silicon, as taught by Parce et al, because the lithographic techniques were well-known, reliable, and suitable for large-scale production.

It would also have been obvious to modify the device of Ramsey et al by fabricating the substrate from silicon, as taught by Parce et al, for the same reason.

13. Claims 4, 6 and 53 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Kamentsky et al or Ramsey et al in view of Parce et al. (U.S. 5,885,470)

Kamentsky and Ramsey et al disclose devices as described above in addressing claim 51. Kamentsky also suggests flexibility in choice of substrate materials. (Column 1, lines 64-69)

Neither Kamentsky nor Ramsey et al explicitly disclose constructing the channels from silicone elastomers (Claim 4) or specifically polydimethylsiloxane (PDMS) (Claim 53); or molding the substrates by impression from an etched silicon mold. (Claim 6)

Parce et al disclose molding substrates with capillary channels for analytical devices from silicone elastomers (specifically PDMS) (Column 5, lines 16-67), and molding the devices by impression from an etched silicon wafer mold. (Column 13, lines 44-57)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kamentsky by replacing his glass substrate for a PDMS substrate molded against an etched silicon mold, as taught by Parce et al, because it would allow low-cost, large scale fabrication of the devices.

It would also have been obvious to modify the device of Ramsey et al by replacing his glass substrate for a PDMS substrate molded against an etched silicon mold, as taught by Parce et al, for the same reason.

14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kamentsky in view of Aine et al.

Kamentsky discloses a device as described above in addressing claim 51.

Kamentsky does not explicitly disclose using a "microvalve" to control fluid flow.

Aine et al disclose a microvalve fabricated in a glass substrate, which is operative to control fluid flow through a channel. (Figure 5; Column 3, line 67 - Column 4, line 10)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kamentsky by replacing the valves in the branch channels with the microvalves taught by Aine et al, because such valves would allow construction of smaller, more completely integrated devices.

15. Claims 22-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over either Kamentsky or Ramsey et al in view of Asgari et al.

Kamentsky and Ramsey et al disclose devices as described above in addressing claim 51. Kamentsky also discloses flexibility in the basis for detection and selection. (Column 1, lines 71-75) Ramsey et al disclose fluorescence detection in another embodiment. (Column 4, lines 4-6)

Neither Kamentsky nor Ramsey et al explicitly disclose detection and selection of cells based on fluorescent or radioactive reporters.

Asgari et al disclose labeling, detection, and selection of cells labeled with fluorescent, chemiluminescent or radioactive reporters. (Column 3, lines 18-21; Column 21, line 54 - Column 22, line 35)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Kamentsky by labeling cells to be analyzed with characteristic reporters (and providing suitable detectors), as taught by Asgari et al,

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because such detection methods are conventional, and it would allow the device to be used to analyze a wider variety of cells, and separate them based on a wider variety of characteristics.

It would also have been obvious to modify the device of Ramsey et al by labeling cells to be analyzed with characteristic reporters (and providing suitable detectors), as taught by Asgari et al, for the same reasons.

16. Claims 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramsey et al in view of Asgari et al.

Ramsey et al disclose a device as described above in addressing claim 51.

Relevant to claim 35, they also disclose detection of fluorescence from analytes.

(Column 4, lines 1-9)

Relevant to claim 36, Ramsey et al disclose electroosmotic and electrophoretic flow control. (Column 6, lines 35-50)

Relevant to claim 37, Ramsey et al disclose reversible flow. (Column 5, lines 2-5)

Ramsey et al do not explicitly disclose labeling cells for analysis with a fluorescent label (or any label).

Asgari et al teach the labeling of cells to aid in analysis and separation, including fluorescent labels. (Column 3, lines 18-21; Column 21, line 54 - Column 22, line 35)

It would have been obvious to one having ordinary skill in the art at the time the invention was made to modify the device of Ramsey et al by analyzing cells bearing fluorescent labels, as taught by Asgari et al, because it would provide convenient

interrogation means, given the disclosed detector of Ramsey et al, and fluorescent labeling of cells is a conventional aid for analysis.

17. Claims 54, 43-46, and 49 are rejected under 35 U.S.C. 103(a) as being unpatentable over Ramsey et al.

Relevant to claim 54, Ramsey et al disclose a method of using their device (See paragraph 6 above), the method comprising: flowing a sample of cells through the main channel (Figures 16 and 17; Column 7, lines 42-46); interrogating each cell for a characteristic as it passes (Column 7, lines 43-46); and directing the flow of each cell into a branch channel according to the results of the interrogation. (Column 7, lines 43-46)

Relevant to claim 43, Ramsey et al disclose flow control by electroosmosis and electrophoresis. (Column 6, lines 35-50)

Relevant to claims 44-46, Ramsey et al disclose flow control by voltage gradients between the branch channels and the junction, caused by electrodes in the branch channels and the main channel. (Column 3, lines 62-64; Column 8, lines 50-53)

Relevant to claim 49, Ramsey et al disclose reversible flow. (Column 5, lines 2-5)

Ramsey et al do not explicitly disclose a method wherein the cells pass the detector one at a time, on average.

It would have been obvious to one having ordinary skill in the art to modify the method of Ramsey et al by providing the degree of focusing and channel dimensions such that the sample stream allows only one cell at a time to pass the detector, because

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it would maximize the accuracy of the cell sorting method. Given the dimensions of the channels described (Column 3, lines 49-55), and the narrowness of the focused stream (Column 5, lines 32-40; Column 6, lines 40-47), this would be within the skill of one of ordinary skill.

Double Patenting

18. Claims 51, 52, 5, 8, 13-17, 27, 32, and 34 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,221,654 in view of Kamentsky.

Claim 1 of U.S. Patent No. 6,221,654 claims a device according to all limitations of instant claims 51, 52, and 32, except that it specifies the analysis of polynucleotides.

Kamentsky discloses an apparatus according the instant claims 51, 52 and 32, and further discloses the suitability of the device for analyzing generalized biological samples (including cells). (Column 1, lines 48-50, 60-75) In addition Kamentsky discloses similar devices corresponding to the limitations of instant claims 8, 13-17, 27, and 34, as described above in paragraph 5.

It would have been obvious to one having ordinary skill in the art to use the device of claim 1 of U.S. Patent No. 6,221,654 for analysis of a variety of biological compounds or cells, as taught by Kamentsky, because Kamentsky shows the usefulness of devices of this type for such purposes.

It would also have been obvious to modify the device of claim 1 of U.S. Patent No. 6,221,654 to include the limitations of instant claims 8, 13-17, 27, 32, and 34, as taught by Kamentsky, because they are all conventional features of devices of this type.

Additionally, the limitations of claim 1 of U.S. Patent No. 6,221,654 that are not present in instant claims 51, 52, and 32 (e.g. one particle at a time passing the detector) constitute optional features that would be obvious to include or exclude based on the specifics of the desired analysis.

19. Claims 2, 3, 10, 11, 18, 19, 21-23, 25, 26, 28, 29, 31, 33, 35, and 36 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 17 (Instant claim 2); 25 (3); 15 (10, 36); 19 (10, 11, 18, 19); 6 (21); 11 (22, 23); 10 (25); 13 (26); 9 (28, 29, 31); 20 (33); and 12 (35) of U.S. Patent No. 6,221,656 in view of Kamentsky. Note - the instant claims that correspond to the listed claims of U.S. Patent No. 6,221,654 follow the listed claims in parentheses. The reasoning for this rejection parallels that given above in paragraph 18.

20. Claims 4, 6, and 53 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,221,654 in view of Kamentsky and Parce et al (U.S. 5,885,470). The reasoning for this rejection parallels that of paragraphs 13 and 18.

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21. Claim 7 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,221,654 in view of Kamentsky and Ramsey et al. The reasoning parallels that given in paragraphs 5, 6 and 18 above.

22. Claims 9, 20, 30, and 37 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,221,654 in view of Kamentsky and Blankenstein. The reasoning parallels that given in paragraphs 5, 8 and 18 above.

23. Claim 12 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,221,654 in view of Kamentsky and Gourley et al. The reasoning parallels that given in paragraphs 5, 7 and 18 above.

24. Claim 24 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,221,654 in view of Kamentsky and Asgari et al. The reasoning parallels that given above in paragraphs 15 and 18.

25. Claims 54 and 39 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent

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No. 6,344,325 in view of Kamentsky. Claim 1 of U.S. Patent No. 6,221,654 claims a method according to all limitations of instant claim 54, except that it specifies the analysis of polynucleotides. Kamentsky discloses the limitations of claim 39 as described above in paragraph 5, which constitutes an obvious modification of the device to be used in this method. Additional reasoning for this rejection parallels that given above in paragraph 18.

26. Claims 40-49 are rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 4 (Instant claim 40); 10 (41); 16 (42); 19 (43-45, 47, and 48); 18 (46); and 23 (49) of U.S. Patent No. 6,334,325 in view of Kamentsky. Note - the instant claims that correspond to the listed claims of U.S. Patent No. 6,221,654 follow the listed claims in parentheses. Kamentsky discloses devices corresponding to the limitations of claims 44, 45, 47, and 48, as described above in paragraph 5. These conventional aspects of methods for using devices of this type, and would be obvious modification to the methods discussed above. Additional reasoning for this rejection parallels that given above in paragraph 18.

27. Claim 50 is rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claim 1 of U.S. Patent No. 6,344,325 in view of Kamentsky and Blankenstein. The reasoning parallels that given in paragraphs 5, 8 and 18 above.

Conclusion

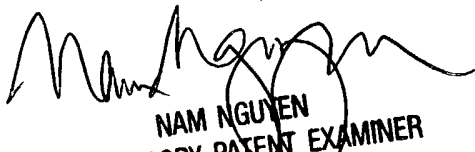
28. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Brody, Buican et al, and Bronstein et al disclose devices and methods for cell sorting using pressure, optical trapping, and chemiluminescence detection, respectively.

29. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dr. Jeffrey Barton, whose telephone number is (571) 272-1307. The examiner can normally be reached Monday-Friday from 8:30 am – 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam Nguyen, can be reached at (571) 272-1342. The fax number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at (866) 217-9197 (toll-free).

JTB
October 28, 2004


NAM NGUYEN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1700